

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants: Travelute et al.

Examiner: Hai Vo

Serial No.: 10/813,893

Group Art Unit 1771

Filed: March 31, 2004

Docket: 3000.193

Title: LOW DENSITY LIGHT WEIGHT FILAMENT AND FIBER

February 24, 2009

APPEAL BRIEF UNDER 37 CFR § 41.37

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This Appeal Brief is presented in support of the Notice of Appeal to the Board of Patent Appeals and Interferences, filed on May 5, 2008, from the Non-Final Rejection of claims 1-9, 11-16, 20, 21, 40, 41, 43, 45-48, 51-57 and 60 of the above-identified application, as set forth in the Office Action mailed on December 7, 2007. This brief has been revised in response to the Notice of Non-Compliant Appeal Brief mailed September 2, 2008.

The requisite fee for an appeal brief (37 C.F.R. § 41.20(b)(2)) has already been paid.

The Commissioner of Patents and Trademarks is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-0332

The Appellants respectfully request consideration in reversal of Examiner's rejections of pending claims.

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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1. REAL PARTY IN INTEREST

The real party in interest of the above-captioned patent application is the assignee of record, Wellman, Inc.

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2. RELATED APPEALS AND INTERFERENCES

There are no other applications, patents, prior or pending appeals or interferences or other judicial proceedings known to Appellants, or to the Appellants' undersigned legal representative, which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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3. STATUS OF THE CLAIMS

The present application was filed on March 31, 2004 with claims 1-11 and 13-73. Claims 22-39 and 61-73 have been withdrawn. Claims 10, 17-19, 42, 44, 49, 50, 58 and 59 were canceled during prosecution. A non-final Office Action was mailed December 6, 2005. Another non-final Office Action was mailed August 22, 2006. A Final Office Action was mailed April 19, 2007. An Advisory Action was mailed on June 5, 2007. A Request for Continued Examination was mailed by Appellant on October 12, 2007. A non-final Office Action was mailed on December 7, 2007. Claims 1-9, 11-16, 20-41, 43, 45-48, 51-57 and 60-73 are pending. Claims 1-9, 11-16, 20, 21, 40, 41, 43, 45-48, 51-57 and 60 stand rejected.

Claims 1-6, 11 and 14-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987).

Claims 8, 9, 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987) as applied to claim 1, and further in view of JP 08-260285.

Claims 55-57 and 60 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Li *et al.* (U.S. Patent No. 4,626,390).

Claims 1-7, 11, 13-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (U.S. Patent No. 4,626,390) in view of Nichols *et al.* (U.S. Patent No. 6,485,829).

Claim 16 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (U.S. Patent No. 4,626,390) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) as applied to claim 1, and further in view of Soehngen *et al.* (U.S. Patent No. 4,290,987).

Claims 8, 9, 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (U.S. Patent No. 4,626,390) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) as applied to claim 1, and further in view of JP 08-260285.

Claims 40, 41, 43, 45-48, and 51-54 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (U.S. Patent No. 4,626,390) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Travelute *et al.* (U.S. Patent No. 5,407,625).

Claims 1-6, 8, 9, 11, 14-16, 20, 21 rejected over Siggel *et al.* in view of Nichols *et al.* and Soehngen *et al.* are the subject of this appeal.

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4. STATUS OF AMENDMENTS

No amendments have been made subsequent to the non-final Office Action dated December 7, 2007

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5. SUMMARY OF CLAIMED SUBJECT MATTER

This summary is presented in compliance with requirements of Title 37 C.F.R. § 41.37(c)(1)(v), mandating a “concise explanation of the subject matter defined in each of the independent claims involved in the appeal...” Nothing contained in this summary is intended to change the specific language of the claims described, nor is the language of this summary to be construed so as to limit the scope of the claims in any way.

Appellants’ invention relates to synthetic filaments and fibers and products made from such filaments and fibers and in particular relates to low density light weight polyester filaments and fibers (Specification: page 1 at [0001], Background).

Independent Claim 1 (Specification: page 2 at [0018], [0020], [0021], [0023] and [0024], page 3 at [0035], [0036], [0040], and [0044] and page 4 at [0048])

Some embodiments of the lightweight, low density foamed fiber according to the Application include: a copolymer of polyester and polyethylene glycol with the polyethylene glycol being present in an amount of between about six and ten percent by weight (Specification: page 2 at [0021]); more than thirty five percent functional void fraction in the form of foam-forming cells (Specification: page 2 at [0018] and [0020], page 4 at [0048]); at least five void cells per axial cross section (Specification: page 2 at [0023], page 3 at [0035], [0036], [0040], and [0044]); and submicron-sized particles of a fluorocarbon nucleating agent (Specification: page 2 at [0024]).

This summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellants refer to each of the appended claims and its legal equivalents for a complete statement of the invention.

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6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

§103 Rejection of the Claims

Claims 1-6, 11 and 14-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987).

Claims 8, 9, 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987) as applied to claim 1, and further in view of JP 08-260285.

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7. ARGUMENT

The 103 Rejections based on Siggel, Nichols and Soehngen

Claims 1-6, 11 and 14-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987).

Claims 8, 9, 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel *et al.* (U.S. Patent No. 4,164,603) in view of Nichols *et al.* (U.S. Patent No. 6,485,829) and Soehngen *et al.* (U.S. Patent No. 4,290,987) as applied to claim 1, and further in view of JP 08-260285.

Because all of the claims are thus rejected under at least the combination of Siggel *et al.* in view of Nichols *et al.* and Soehngen *et al.*, all of the rejections are addressed in a single argument, including those rejections that include JP 08-260285.

The Examiner argues that Siggel *et al.* in view of Nichols *et al.* and Soehngen *et al.* renders Claims 1-6, 8, 9, 11, 14-16, 20 and 21 obvious. The law states that the transitional phrase “consisting essentially of” excludes elements that would “materially affect the basic and novel characteristics of the claimed invention.” *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1574 (Fed. Cir.1984) (emphasis added). Siggel *et al.* states that silicone oil is a necessary ingredient of its disclosed foamed fiber. This raises two issues: 1) whether silicone oil would materially affect the basic and novel characteristics of the claimed foamed fiber; and 2) whether Examiner’s conclusion that the silicone oil taught by Siggel *et al.* avoids materially affecting Appellants’ foamed fiber is unfair and unsubstantiated.

At filing, the independent claims in question contained the transitional phrase “comprising;” however, Appellants amended these claims to contain the transitional phrase “consisting essentially of” to help distinguish the claimed invention from the Siggel *et al.* patent. Siggel *et al.* teaches that silicone oil is necessary to produce a foamed polyester filament having a plurality of adjacent, separate, discontinuous cavities. Appellants’ independent claims do not include silicone oil as a necessary element of the foamed fiber of

the invention. The Examiner argues that Appellants' use of the transitional phrase "consisting essentially of" allows the addition of silicone oil rendering the claimed invention obvious in view of Siggel *et al.* As previously mentioned, the law states that the transitional phrase "consisting essentially of" excludes elements that would "materially affect the basic and novel characteristics of the claimed invention." *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1574 (Fed. Cir.1984); *In re Garnero*, 56 C.C.P.A. 1289 (1969); *Ex Parte Davis*, 80 U.S.P.Q. (BNA) 448, 449-50 (Pat. Off. Bd. App. 1948). Therefore, the proper inquiry is whether the addition of silicone oil would "materially affect the basic and novel characteristics of the claimed invention." *Garnero* 56 C.C.P.A. 1289.

Examiner's Arguments

The Examiner acknowledges in the Advisory Action of June 5, 2007 that silicone oil is a required component of the Siggel *et al.* fiber composition. In the Office Action of December 7, 2007 the Examiner states that Siggel *et al.* teaches the addition of silicone oil to enhance the formation of separate, discontinuous cavities in foamed fibers. The Examiner then summarily concludes that the addition of silicone oil would not materially affect the basic and novel properties of the claimed invention because the claimed foamed fiber also exhibits separate, discontinuous cavities. The Examiner's conclusion does not follow from the teachings of Siggel *et al.* If silicone oil enhances the formation of separate discontinuous cavities, then it would materially affect one of the basic and novel characteristics of the claimed invention. The Examiner is simultaneously arguing that silicone oil will affect the properties of the claimed invention and concluding that it will not.

Furthermore, the Examiner offers no argument in support of his conclusion that the silicone oil taught by Siggel *et al.* would not materially affect Appellants' foamed fiber. It is obvious from the teaching of Siggel *et al.* that silicone oil affects Siggel's foamed fiber, but the proper inquiry is whether the silicone oil would materially affect the elements of Appellants' invention.

Rather than offering an argument in support of his conclusion, the Examiner maintains the position that Appellants have the burden of establishing that the silicone oil taught in the Siggel *et al.* reference would materially change the characteristics of Appellants invention.

Appellants' Submissions and Arguments

Appellants have submitted that Siggel *et al.* demonstrates that the silicone oil materially changes the characteristics of polyester filaments that are intended to be produced with "adjacent, separate discontinuous cavities" '603 Patent to Siggel *et al.* col. 5 l. 3. The necessity of silicone oil is emphasized throughout the Siggel *et al.* patent. Appellants accordingly submit that because Siggel *et al.* emphasizes the use of silicone oil so strongly, the silicone oil necessarily describes an item that (in Siggel *et al.*'s opinion) affects the novel or basic characteristics of foamed polyester filaments. The Examiner has not accepted this submission as satisfaction of Appellants' alleged burden.

Claims using the transitional phrase "consisting essentially of," which did not include an element used in the prior art were deemed patentable and nonobvious in the *Garnero* case. In *Garnero*, the prior art disclosed a product that included a bonding agent to fuse particles. The claimed invention was a similar product that contained particles fused without a bonding agent. The Examiner and the Board rejected the claims under 35 U.S.C. 103. The Board rejected the appellant's argument that the claim language "consisting essentially of" would exclude the presence of a bonding agent and therefore distinguish the claimed invention from the prior art. The Court of Customs and Patent Appeals reversed because the court determined that the addition of a bonding agent would materially affect the basic and novel characteristics of the product.

The application of *Garnero* to the current appeal is very appropriate. Appellants' foamed fiber is comprised of a plurality of separate, discontinuous cavities that are formed without silicone oil. In *Garnero*, the claimed invention comprised particles fused without a bonding agent. Appellants' invention achieves a result (separate discontinuous cavities)

without an element (silicone oil) that the prior art teaches is necessary. In *Garnero*, the claimed invention achieved a result (the fusion of particles) without an element (a bonding agent) that the prior art taught as necessary. *Garnero* demonstrates that in situations such as this, one of the basic and novel characteristics of a claimed invention may be its exclusion of an element which the prior art teaches is necessary. Furthermore, the *Garnero* case demonstrates that this exclusion is sufficient to overcome a 35 U.S.C 103 rejection even when the claims in question use the transitional phrase “consisting essentially of.” Appellants submit that the reasoning demonstrated in the *Garnero* case be applied in the present appeal.

The Examiner has rejected Appellants’ argument that Siggel *et al.* demonstrates that silicone oil would materially affect the basic and novel characteristics of Appellants’ foamed fiber and, therefore, maintains the position that Appellants have the burden of establishing that the addition of silicone oil would materially change the characteristics of the claimed invention. The Examiner has cited *In re Delajarte*, 52 C.C.P.A., 337 F.2d 870 (1964), in support of his position.

Appellants’ respectfully submit that although this case contains the statements relied upon by the Examiner, it also stands for the proposition that in appropriate circumstances, no justification exists for placing a burden on an applicant to conduct experiments to determine the difference in properties between a claimed invention and a cited reference.

In the total absence of evidence in the record to indicate that the amber glass disclosed by Lyle would be expected to have desirable electrical insulating properties, we can find no justification for placing the burden on applicant to conduct experiments to determine the insulating properties of the colored glass disclosed by Lyle. Although there are only very slight differences between the Lyle composition and that sought to be patented, we cannot assume that these small differences are incapable of causing a difference in properties. Appellant in showing that his glass has basic and novel properties (at least as far as the record is concerned), would appear to have met his burden.

337 F.2d at 874. Appellants’ have submitted the teachings of Siggel *et al.* as evidence that silicone oil will affect the basic and novel characteristics of the claimed invention, but the Examiner has not accepted this evidence as sufficient to relieve Appellants’ alleged burden.

The Examiner, although not explicitly, appears to be demanding nothing short of experimental evidence, i.e. that Appellants must add silicone oil as Siggel *et al.* teaches and submit the results as evidence. The *Delajarte* case explicitly states that such a burden is unjustified, and given Appellants' showing that the foamed fiber of the claimed invention has basic and novel properties, they have met their burden of rebutting the finding of obviousness. *Id.*

Accordingly, Appellants respectfully request that the Examiner's decision be reversed and Claims 1-9, 11, 14-16, 20 and 21 passed to allowance.

Respectfully submitted,

/ss/ Philip Summa

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8. CLAIMS APPENDIX

1. (Previously Presented) A lightweight, low density foamed fiber consisting essentially of:

a copolymer of polyester and polyethylene glycol, with the polyethylene glycol being present in an amount of between about 6 and 10 percent by weight, said copolymer having a greater elasticity than a corresponding monomer-based polyester;

more than thirty five percent functional void fraction in the form of foam-forming cells for reducing the density of the fiber as compared to a solid fiber;

at least five void cells per axial cross section for increasing the structural integrity of the fiber as compared to less uniform foams; and

submicron-sized particles of a fluorocarbon nucleating agent, present in an amount less than 10 percent by weight.

2. (Previously Presented) A foamed fiber according to Claim 1 wherein said fluorocarbon nucleating agent comprises polytetrafluoroethylene.

3. (Original) A foamed fiber according to Claim 1 having a denier of between about 6 and 15.

4. (Original) A foamed fiber according to Claim 1 having between about 50 and 75% functional void fraction.

5. (Original) A foamed fiber according to Claim 1 having between about 6 and 30 cells per cross section.

6. (Original) A foamed fiber according to Claim 1 having a smooth surface.

7. (Original) A foamed fiber according to Claim 1 having a fibrillated surface for increasing the moisture transfer capabilities of the fiber.

8. (Original) A foamed fiber according to Claim 1 having a channeled surface.

9. (Original) A foamed fiber according to Claim 1 having a pitted surface.

10. (Cancelled)

11. (Original) A foamed fiber according to Claim 1 having a density of between about 0.4 and 0.6 g/cm³.

13. (Original) A foamed fiber according to Claim 1 having open and closed cells.

14. (Original) A fabric comprising fibers according to Claim 1.

15. (Original) A fabric according to Claim 14 selected from the group consisting of woven fabrics, knitted fabrics and non-woven fabrics.

16. (Original) A foamed fiber according to Claim 1 comprising about one percent by weight of said submicron particles of fluorocarbon polymer.

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Original) A low density, light weight fiber according to Claim 1 comprising a non-uniform surface for providing additional mechanical properties to the foamed fiber as compared to corresponding smooth surface fiber.

21. (Original) A fabric formed from the foamed fiber according to Claim 20 and selected from the group consisting of woven fabrics, non-woven fabrics, and knitted fabrics.

22. (Withdrawn) A method of producing a foamed fiber in a continuous technique, the method comprising:

dissolving an inert blowing agent in an amount sufficient to generate at least about 35% void fraction in resulting spun filaments in its liquid state in a polyester copolymer to form a solution of the blowing agent in the copolymer;

mixing an inert nucleating agent with the polyester copolymer in an amount sufficient to increase the number of cells that the blowing agent will generate as compared to blowing agent alone under the same conditions, but less than an amount that adversely affects the spinning process;

adding the solution and nucleating agent mixture in the liquid state to an extruder; forwarding the mixture to a spinneret at a higher than normal polyester extrusion pressure to give extra shear and encourage expansion of the blowing agent as the filaments leave the spinneret; and

spinning the mixture into filaments through the spinneret.

23. (Withdrawn) A method according to Claim 22 further comprising: quenching the filaments in an otherwise conventional manner; and thereafter taking up and drawing the filaments in a combined spin-drawing step.

24. (Withdrawn) A method according to Claim 22 comprising maintaining a sufficient pressure in the extruder to keep the dissolved blowing agent in solution at the temperature of the liquid copolymer solution.

25. (Withdrawn) A method according to Claim 22 wherein the step of forwarding the mixture at higher than normal pressure comprises filtering the mixture at a higher than normal pressure.

26. (Withdrawn) A method according to Claim 22 comprising dissolving the blowing agent in an amount of between about 2 and 10 percent by weight based on the weight of the copolymer.

27. (Withdrawn) A method according to Claim 22 comprising dissolving the blowing agent in an amount of between about 4 and 5 percent by weight based on the weight of the copolymer.

28. (Withdrawn) A method according to Claim 22 comprising dissolving a fluorinated hydrocarbon as the blowing agent.

29. (Withdrawn) A method according to Claim 28 wherein the blowing agent comprises CF₃CH₂F.

30. (Withdrawn) A method according to Claim 22 wherein the step of mixing the nucleating agent with the polyester copolymer comprises:

preparing a masterbatch of the nucleating agent and the polyester copolymer with the nucleating agent present in a higher proportion than desired for extrusion; and

thereafter mixing the masterbatch with additional polyester copolymer until the concentration of nucleating agent in the copolymer reaches the extrusion amount.

31. (Withdrawn) A method according to Claim 30 comprising preparing a masterbatch of submicron particles selected from the group consisting of silicone and fluorinated hydrocarbon as the nucleating agent with a copolymer of polyethylene terephthalate and polyethylene glycol.

32. (Withdrawn) A method according to Claim 30 comprising preparing a masterbatch that is about 5 percent by weight of nucleating agent and thereafter mixing one part of the masterbatch with between about 3 and 9 parts of the copolymer.

34. (Withdrawn) A method according to Claim 22 wherein the step of mixing the nucleating agent with the polyester copolymer comprises mixing a nucleating agent in the solid state with polymer chips.

35. (Withdrawn) A method according to Claim 23 comprising heat setting the filament.

36. (Withdrawn) A method according to Claim 30 comprising preferentially directionally quenching the spun filaments to thereby develop different degrees of orientation across the filaments that produce self-crimping when the preferentially-quenched filaments are heat-set.

37. (Withdrawn) A method according to Claim 22 comprising texturing the spun filaments.

38. (Withdrawn) A method of forming a low density filament according to Claim 22 comprising spinning the mixture into hollow filaments through the spinneret by extruding the filaments as adjacent pairs of c-shaped filaments that join as they are passively or actively

quenched to form a hollow filament with a sheath foamed by the blowing agent during the extrusion from the spinneret.

39. (Withdrawn) A method according to Claim 38 comprising filtering the mixture at higher than normal polyester extrusion pressure to give extra shear and encourage expansion of the blowing agent as the filaments leave the spinneret.

40. (Previously Presented) A self-crimping foamed filament consisting essentially of: a copolymer of polyester and polyethylene glycol, with the polyethylene glycol being present in an amount of between about 6 and 10 percent by weight,;

at least about 40% void space by volume

more than 5 cells per axial cross section;

different degrees of orientation along at least two adjacent longitudinal portions of the filament; and

submicron sized solid particles of a fluorocarbon polymer in an amount not exceeding about two percent by weight.

41. (Original) A self-crimping filament according to Claim 40 comprising between about 45 and 75% void space by volume.

42. (Cancelled)

43. (Original) A self-crimping filament according to Claim 40 comprising between about 6 and 30 cells per axial cross section.

44. (Cancelled)

45. (Original) A self-crimping filament according to Claim 40 having a denier of between about 6 and 15.

46. (Original) A self-crimping filament according to Claim 40 having a density of between about 0.4 and 0.6 grams per cubic centimeter.

47. (Original) A fabric formed from the self-crimping filament according to Claim 40 and selected from the group consisting of woven fabrics, non-woven fabrics and knitted fabrics.

48. (Previously Presented) A low density light weight foamed fiber consisting essentially of:

a copolymer of polyester and polyethylene glycol, with the polyethylene glycol being present in an amount of between about 6 and 10 percent by weight;

a hollow core for reducing the overall density of the fiber compared to a solid fiber;

a foamed sheath for further reducing the overall density as compared to a solid-sheath hollow fiber; and

submicron sized particles of a fluorocarbon polymer and present in an amount not exceeding two percent by weight.

49. (Cancelled)

50. (Cancelled)

51. (Original) A low density light weight fiber according to Claim 48 wherein said foamed sheath has a void fraction of at least about 35 percent by volume.

52. (Original) A low density light weight fiber according to Claim 48 having a density of between about 0.3 and 0.7 grams per cubic centimeter.

53. (Original) A low density light weight fiber according to Claim 48 having a density of between about 0.45 and 0.55 grams per cubic centimeter.

54. (Original) A fabric formed from the fiber according to Claim 48 and selected from the group consisting of woven fabrics, non-woven fabrics and knitted fabrics.

55. (Previously Presented) A low density foamed fiber consisting essentially of:
a copolymer of polyester and polyethylene glycol, with the polyethylene glycol being present in an amount of between about 6 and 10 percent by weight;

irregular longitudinal surface effects that in length are at least an order of magnitude greater than the average diameter of the fiber and that in width are at least an order of magnitude smaller than the average diameter of the fiber; and

submicron particles of a fluorocarbon polymer present in an amount of no more than about 2 percent by weight.

56. (Original) A low density fiber according to Claim 55 having a density no greater than 1.10 grams per cubic centimeter.

57. (Original) A low density fiber according to Claim 55 having a density no greater than 0.75 grams per cubic centimeter.

58. (Cancelled)

59. (Cancelled)

60. (Original) A fabric formed from the low density fiber according to Claim 55 and selected from the group consisting of woven fabrics, non-woven fabrics, and knitted fabrics.

61. (Withdrawn) A process for melt extrusion of thermoplastic foam comprising:
extruding a molten mixture of an elastic thermoplastic polymer with a melt viscosity of at least about 1000 poise at extrusion temperature, and a molecular relaxation time of at least about 1 millisecond;

and containing an additive comprised of insoluble particles in the size range from about 50 nanometers to about 500 nanometers, at an additive level from about 0.1% to about 1.0% by weight;

and containing a dissolved blowing agent in an amount sufficient to generate a gas pressure from about 5 atmospheres to about 200 atmospheres at extrusion temperature;

through a nozzle at a flow rate sufficient to generate a wall shear rate exceeding 1000 per second.

62. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding a polymer with a melt viscosity of between about 1000 and 20,000 poise

63. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding a polymer at an extrusion temperature of between about 260 and 310 °C.

64. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding polyester as the thermoplastic polymer.

65. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding a copolymer of polyester and polyethylene glycol, with the polyethylene glycol being present in an amount of between about 6 and 10 percent by weight of the copolymer.

66. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding a mixture in which the insoluble particles are selected from the group consisting of silicone and polytetrafluoroethylene.

67. (Withdrawn) A melt extrusion process according to Claim 61 further comprising: quenching the filaments in an otherwise conventional manner; and thereafter taking up and drawing the filaments in a combined spin-drawing step.

68. (Withdrawn) A melt extrusion process according to Claim 67 comprising a post-quench draw-down ratio greater than 100:1.

69. (Withdrawn) A melt extrusion process according to Claim 61 comprising dissolving the blowing agent in an amount of between about 2 and 10 percent by weight based on the weight of the copolymer.

70. (Withdrawn) A melt extrusion process according to Claim 61 wherein the blowing agent comprises CF₃CH₂F (Freon 134a).

71. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding the mixture at a pump pressure of between about 500 and 3000 psi.

72. (Withdrawn) A melt extrusion process according to Claim 61 comprising extruding a mixture in which the intrinsic viscosity of the polymer is less than 0.7.

73. (Withdrawn) A foamed thermoplastic fiber or film article containing elongated voids wherein:

the smallest linear dimension of said article does not exceed 0.5 mm;

the average cross sectional diameter of the included voids does not exceed about 20% of the smallest linear dimension;

the length of said voids is at least 2 times longer than their diameter; and

said voids are present in sufficient number to comprise at least 10% of the volume of said thermoplastic article.

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9. EVIDENCE APPENDIX

None.

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10. RELATED PROCEEDINGS APPENDIX

None.

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